Solar PV in Bangladesh: The Way Forward

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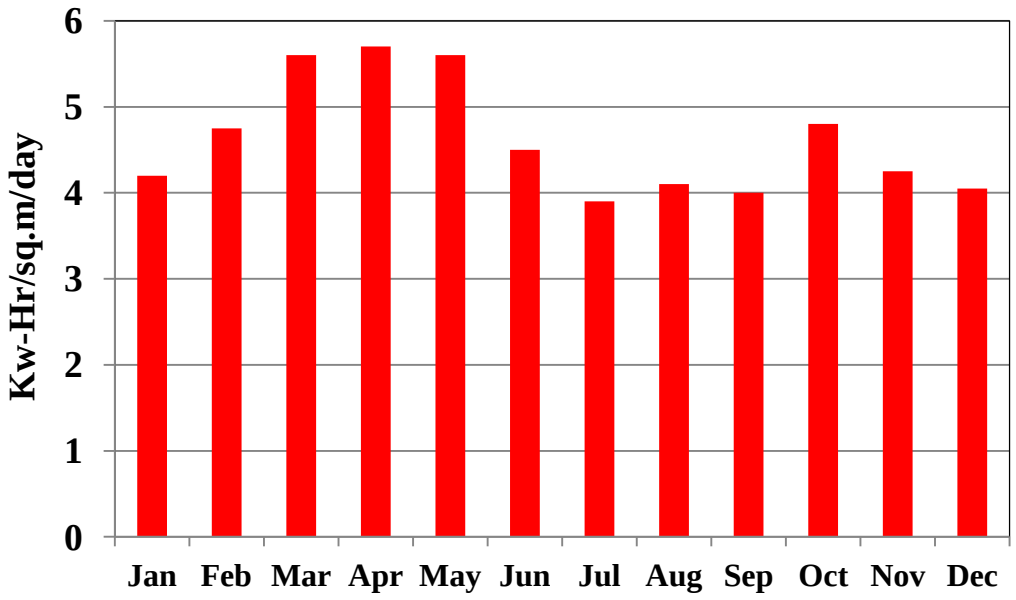
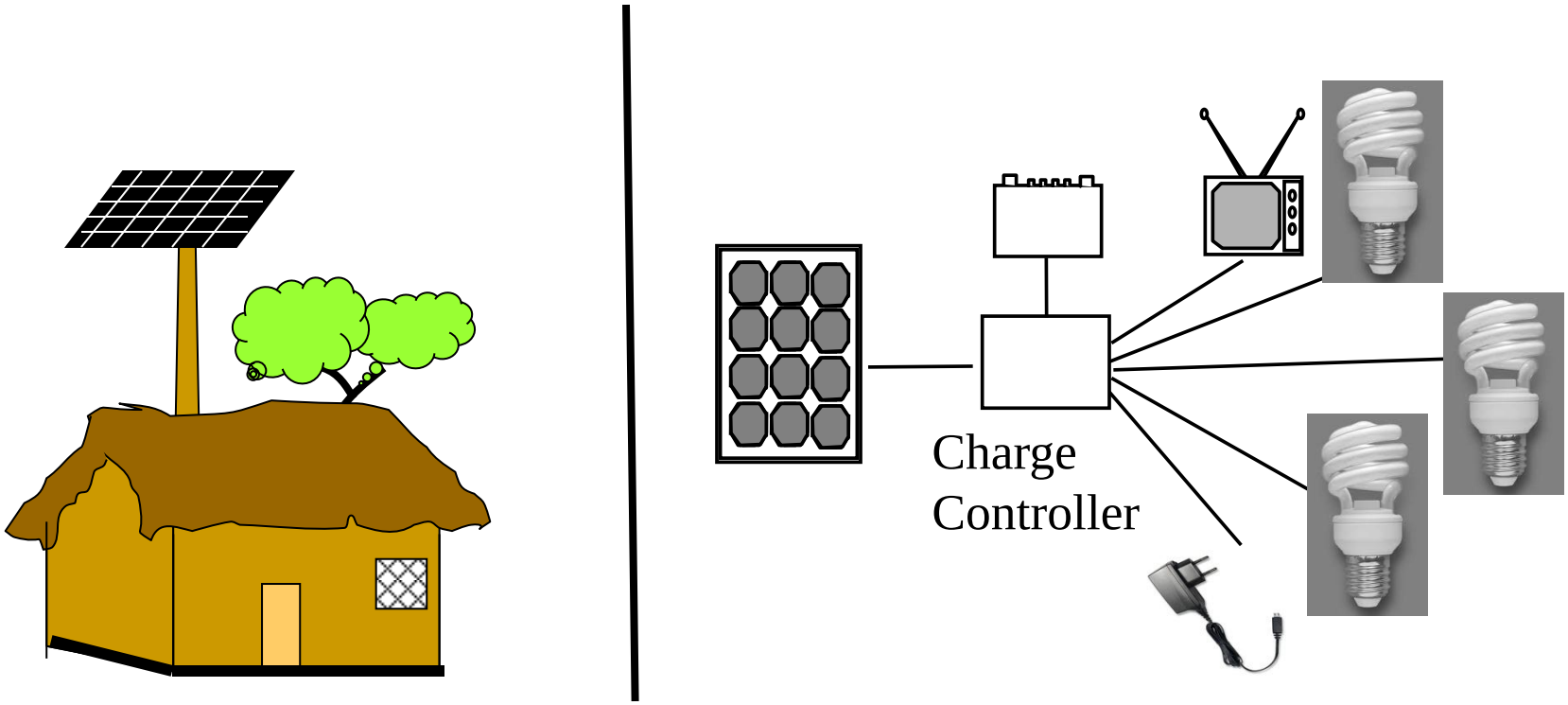
Solar Energy in Bangladesh

- Average daily insolation is around 4.5kW-hr/sq.m, which is quite significant



Solar PV in Bangladesh

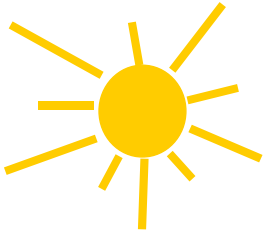
- A Typical Solar Home System (SHS)



When first introduced in Bangladesh, among the components

- PV was most expensive
- Battery was most vulnerable

Solar Home System…



- Presently there are more than 2.5 million solar home system installed in Bangladesh and it is growing at a rate of more than 50,000 every month
- Reasons for success: Innovative approaches
  - Adoption of local products like tubular plate batteries and charge controllers in the system; easy maintenance
  - Awareness campaign: It is reliable and cost is comparable to kerosene lamps but free from fire and health (smoke) hazard. Opportunity for mobile charging and entertainment like TV
  - Introduction of micro-credit facility with ownership model by IDCOL and enforcement of quality control through a Technical Standard Committee

Further Innovations on SHS

- The size of the battery can be reduced if we increase the size of the panel. For worst possible days (considering poor sunshine) the insolation remains around 2kW-hr/day/sq.m.
- With falling price of the PV and increasing price of the battery, this is a very attractive proposition
- Opens up options for day time load

Further Innovations in SHS….

- **Using higher voltage DC-DC converter**
  - •Higher voltage at the output reduces the current
  - • Most of the electronics based gadgets like TV/LED/CFL lamps operate over a wide voltage range of 90-270V and operates equally well in both DC and AC
  - •The higher voltage gadgets are cheaper and are readily available in the market
  - •More than one households can share the same panel, charge controller and battery as distance can be increased

What next…

- Clustering of PV panels : It can utilize the load diversity and sharing of energy in between the users to make it more efficient
- Nano-grid: A concept to have a small PV installation like 2-3kW and a battery bank located centrally. 10-20 households and one small irrigation pump can be connected to the nano-grid. DC is the preferable choice for the nano-grids to avoid inverter costs
- Stand alone micro/mini grids

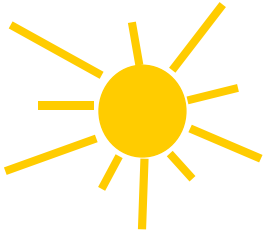
New applications

- Integrated approach to PV based irrigation and household consumption considering seasonal variation
- Development of small scale PV-diesel hybrid cold storage for short term storage of perishable agro products
- Rural transportation system like ferry boats

New concept

- DC systems
  - Do not rectify, use DC
  - Simpler design with no need for inverter
  - Reduction in cost and system loss
  - Almost no changes needed on the user side
  - Distributed PV generation is easy to hook up with the transmission line making expansion easier

Future of PV in Bangladesh



- Immediate (3-5 Years)
  - Clustering of SHSs
  - Stand alone Nano and mini grids
- Intermediate (5-15 years)
  - Connection of SHS clusters and stand alone grids to national grid system
  - Grid connected PV systems using the non-cultivable lands like motor ways and rail roads
- Long term (15-20 years)
  - National grids converted to DC

Thank You